

1

moment = 252

1

*allow 252 with no working shown for 2 marks*  
*allow 25200 with no working shown for 1 mark*

(b) the clockwise moment (of child B) decreases

1

making it is less than the anticlockwise moment (of child A)  
*accept so moments are no longer balanced*

1

so child A moves downwards

**or**

so child B moves upwards

1

[5]

**M2.** (a) centre of **X** at the centre of the concentric circles  
*judge by eye that the intention is correct*

1

(b) drawn from any corner to the diagonally opposite corner  
*judge by eye that the intention is correct*

**or** from the mid-point of any side to the mid-point of the opposite side  
*if more than one axis of symmetry has been drawn,  
accept only if both / all are correct*

1

(c) a turning

*accept any unambiguous indication*

1

[3]

**M3.** lever

turning effect

pivot

*for 1 mark each*

[3]

**M4.** (a) (i) moment

1

	(ii)	rotation	1	
	(iii)	the girl moves nearer to point <b>P</b>	1	
(b)	(i)	<b>X</b> drawn in the centre of the space enclosed by the tyre <i>judge by eye</i>	1	
	(ii)	below	1	<b>[5]</b>
<b>M5.</b>	(a)	1250 <i>allow 1 mark for correct substitution</i> <i>ie <math>500 \times 2.5</math> provided there is no subsequent calculation</i>	2	
	(b)	(i) smaller than	1	
		(ii) force (exerted) further from axis of rotation (than the weight) <i>accept pivot for axis of rotation</i>	1	
	(c)	increase the force (exerted) <i>do <b>not</b> accept increase distance of force from axis of rotation</i>	1	<b>[5]</b>
<b>M6.</b>	(a)	<b>C</b>	1	

(b) moment  
*accept any unambiguous correct indication* 1

(c) bigger than  
*accept any unambiguous correct indication* 1

(d) 120 (Ncm)  
*allow 1 mark for correct substitution  
ie  $12 \times 10$*  2

[5]

**M7.** (a) (i) 75  
*allow 1 mark for correct substitution ie  $250 \times 0.3$   
do **not** credit if subsequent step shown  
allow 1 mark for an answer 7500* 2

(ii) Nm 1

(b) force is (applied) further from the nut / pivot / axis of rotation  
*handle is longer is insufficient  
do **not** accept less force needed* 1

moment (on wrench) is larger 1

[5]

**M8.** (a) 360  
*allow 1 mark for correct substitution ie  $300 \times 1.2$  provided no  
subsequent step shown*

- (b) the force is applied further from the axis of rotation  
*accept pivot / (tree) stump for 'axis of rotation'*

1

**or**

this increases the moment of the force

increases the force on the (tree) stump

1

**[4]**

- M9.** (a) centre of X drawn at centre of pendulum bob  
*judged by eye*  
*accept dot drawn at centre of circle*

1

(b) (i) 2

*allow 1 mark for correct substitution, ie  $\frac{1}{0.5}$  provided no subsequent step shown*

2

(ii) 30or60 ÷ their (b)(i) correctly calculated

*allow 1 mark for  $\frac{60}{2}$*

*or  $\frac{60}{\text{their (b)(i)}}$*

*or  $0.5 \times 60$*

*provided no subsequent step shown*

2

(c) 51.2

*allow 1 mark for correct substitution, ie  $64 \times 0.8$  provided no subsequent step shown*

2

(d) it increases (the moment)

*must be comparative*

*accept 1 mark for calculation of the moment = 64 (Nm)*

1

[8]

**M10.** (a) 3000

*allow 1 mark for correct substitution, ie  $600 \times 5$  provided no subsequent step*

2

(b) anticlockwise moment  
*must be both words* 1

(c) (i) 3400  
*allow 3.4 kilo (newtons)* 1

(ii) as the distance (of the girl from point A) increases, force F increases  
*allow gets bigger for increases*  
*force is (directly) proportional to distance will negate any correct response* 1

[5]

**M11.** (a) make the rod longer 1

push down on the rod with a greater force

1

(b) particles are close together

1

*so no room for more movement  
dependent on 1st marking point*

1

(c) (i) downward force produces pressure in liquid  
*reference to compression of liquid negates this mark*

1

*this pressure is the same at all points in a liquid  
or  
this pressure is transmitted equally through the liquid  
and  $P = F / A$  or  $F = P \times A$*

1

*area (at load) bigger (so force bigger)*

1

(ii) the force acting on the car moves less distance than the effort force

1

[9]